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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,735	01/25/2007	Yoichiro Tabata	Q96031	9675

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EXAMINER	
CHEN, BRET P	

ART UNIT	PAPER NUMBER
1792	

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09/09/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/588,735	TABATA ET AL.	
	Examiner	Art Unit	
	Bret Chen	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *16-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *16-23 and 26-37* is/are rejected.

7)☒ Claim(s) *24 and 25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/8/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 16-37 are pending in this application, whish is a 371 of PCT/JP05/13170.

The preliminary amendment dated 8/8/06 canceling claims 1-15 and adding new claims 16-37 has been entered.

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
(f) BACKGROUND OF THE INVENTION.
    (1) Field of the Invention.
    (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(g) BRIEF SUMMARY OF THE INVENTION.
(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(i) DETAILED DESCRIPTION OF THE INVENTION.
(j) CLAIM OR CLAIMS (commencing on a separate sheet).
(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Objections

Claims 16, 18, 21 are objected to because of the following informalities listed below. Appropriate correction is required.

In claim 16 line 16, the term “the metal surface” lacks antecedent basis. The examiner has assumed that the electrode has a metal surface. Clarification and appropriate amendments are requested.

In claim 18 line 2, the element should be "Cu". The same issue applies to claim 21.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 16, 19, 30-31, 34-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 16 lines 9-10 and 14-15, the mechanisms in the parenthetical elements are deemed vague and indefinite as to whether these are required by the applicant or not. For the purpose of this office action, the examiner will treat this as being required. Clarification and appropriate amendments are requested. The same issue applies to claim 19, 36-37.

In claim 16 lines 17-18, the term "taking out" is deemed vague and confusing as to where it is taking out from. For the purpose of this office action, the examiner has treated this limitation as removing from the discharge zone. Clarification and appropriate amendments are requested.

In claim 16, the term “high-field” is a relative term which renders the claim indefinite. The term "high" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The same issue applies to claim 19, 36-37.

In claims 30 and 31, the terms “large quantity”, “large … surface” are relative terms which renders the claim indefinite. The term "large" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

In claims 34 and 35, the phrase "by an ozonizer that provided on a previous stage" is vague and confusing. It is not clear what is meant by said phrase. The examiner will assume that an ozonizer is required. Clarification and appropriate amendments are requested.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 16-18, 22, 28, 30, 32, 34, 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al. (2004/0223893).

Tabata discloses an ozone generator for generating ozone by applying a specified process to oxygen by discharge includes a first raw material gas supply unit for supplying the oxygen as a first raw material gas, and a second raw material gas supply unit for supplying an oxide compound gas as a second raw material gas, in which, by excited light, excited and generated by a discharge in the oxygen and the oxide compound gas, the oxide compound gas is dissociated, or the oxide compound gas is excited accelerating dissociation of the oxygen, and ozone is generated (abstract). The ozone generator includes a first electrode, a second electrode facing the first electrode to form a discharge area in which AC voltage is applied between the two electrodes (0033). A photocatalytic material is provided on a dielectric in the discharge area or on the electrode by providing oxygen as a first material gas, along with a second and third material gases and excited by the discharge which results in the production of ozone (0037). The photocatalyst film can be titanium oxide (0180) and the discharge can be a silent discharge (0110-0111). However, the reference fails to specifically teach taking out the surface of the dielectric material and using it as a photocatalyst material.

It is noted that Tabata fairly teaches of forming a photocatalyst material such at titanium oxide on a dielectric material as noted above. One skilled in the art would realize that the photocatalyst material produced by Tabata's process can be removed and used as a photocatalyst. It would have been obvious to remove the photocatalyst material from the discharge zone for use as a photocatalyst.

Regarding claim 17, Tabata teaches the use of a pressure controller (0074) and controlling power density (0065).

Regarding claim 18, Tabata teaches tungsten oxide (0180).

Regarding claim 22, Tabata teaches high purity oxygen (0071).

Regarding claim 28, Tabata teaches a trace quantity of raw material gas (0071) and thus would inherently dilute the oxygen gas.

Regarding claim 30, the applicant requires increasing the electrode area to handle larger surfaces. It is well known that using larger electrodes would result in increased processed areas and hence, would have been obvious to incorporate with the expectation of handing larger surface areas.

Regarding claim 32, Tabata teaches adding nitrogen (0025, 0029).

Regarding claim 34, Tabata teaches an ozonizer (0006).

In independent apparatus claim 36, the applicant additionally requires an oxygen supply means and an AC power source. Tabata teaches an oxygen supply unit and an AC power source (0033).

Claims 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al. (2004/0223893) in view of Segawa et al. (2002/0172628).

Tabata discloses forming a photocatalyst material on a dielectric using raw material gases in a discharge zone as noted above. However, the reference remains silent on a frequency.

Segawa teaches a photocatalysis apparatus which contains a discharge electrode (abstract) in which the AC power source is operated at a frequency of 10kHz or higher (0042). It

is noted that the Segawa's frequency overlaps with the claimed frequency. Overlapping ranges are *prima facie* evidence of obviousness. It would have been obvious to one having ordinary skill in the art to have selected the portion of Segawa's frequency range that corresponds to the claimed range.

Claims 19-21, 23, 29, 31, 33, 35, 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al. (2004/0223893) in view of Saito et al. (6,810,575).

Tabata discloses an ozone generator for generating ozone by applying a specified process to oxygen by discharge includes a first raw material gas supply unit for supplying the oxygen as a first raw material gas, and a second raw material gas supply unit for supplying an oxide compound gas as a second raw material gas, in which, by excited light, excited and generated by a discharge in the oxygen and the oxide compound gas, the oxide compound gas is dissociated, or the oxide compound gas is excited accelerating dissociation of the oxygen, and ozone is generated (abstract). The ozone generator includes a first electrode, a second electrode facing the first electrode to form a discharge area in which AC voltage is applied between the two electrodes (0033). A photocatalytic material is provided on a dielectric in the discharge area or on the electrode by providing oxygen as a first material gas, along with a second and third material gases and excited by the discharge which results in the production of ozone (0037). The photocatalyst film can be titanium oxide (0180) and the discharge can be a silent discharge (0110-0111). However, the reference fails to teach the use of a metal compound gas.

Saito teaches the use of a metal compound gas to form a metal oxide in a reaction zone (abstract) for use as a photocatalyst (col.20 lines 10-22). It would have been obvious to use a

metal compound gas in Tabata's process with the expectation of success because Saito teaches the conventionality of using a metal compound gas to form a metal oxide for use as a photocatalyst.

Regarding claim 20, Tabata teaches the use of a pressure controller (0074) and controlling power density (0065).

Regarding claim 21, Tabata teaches tungsten oxide (0180).

Regarding claim 23, Tabata teaches high purity oxygen (0071).

Regarding claim 29, Tabata teaches a trace quantity of raw material gas (0071) and thus would inherently dilute the oxygen gas.

Regarding claim 31, the applicant requires increasing the electrode area to handle larger surfaces. It is well known that using larger electrodes would result in increased processed areas and hence, would have been obvious to incorporate with the expectation of handing larger surface areas.

Regarding claim 33, Tabata teaches adding nitrogen (0025, 0029).

Regarding claim 35, Tabata teaches an ozonizer (0006).

In independent apparatus claim 37, the applicant additionally requires an oxygen supply means and an AC power source. Tabata teaches an oxygen supply unit and an AC power source (0033). In addition, Saito teaches a metal compound source (col.20 lines 10-22).

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al. (2004/0223893) in view of Saito et al. (6,810,575) and Segawa et al. (2002/0172628).

The combination of Tabata/Saito discloses forming a photocatalyst material on a dielectric using raw material gases in a discharge zone using a metal compound gas as noted above. However, the references remain silent on a frequency.

Segawa teaches a photocatalysis apparatus which contains a discharge electrode (abstract) in which the AC power source is operated at a frequency of 10kHz or higher (0042). It is noted that the Segawa's frequency overlaps with the claimed frequency. Overlapping ranges are *prima facie* evidence of obviousness. It would have been obvious to one having ordinary skill in the art to have selected the portion of Segawa's frequency range that corresponds to the claimed range.

Allowable Subject Matter

Claims 24-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bret Chen whose telephone number is (571)272-1417. The examiner can normally be reached on 7:30am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bret Chen/
Primary Examiner, Art Unit 1792
9/5/09